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Identification of isoflavones in *Acca sellowiana* and two *Psidium* species (Myrtaceae)

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Abstract

Several types of isoflavonoid-like immunoreactivity were detected in water-ethanolic extracts from *Acca sellowiana* (Berg) Burret, *Psidium guajava* L. and *Psidium littorale* Raddi (Myrtaceae) leaves. Chromatographic mobility of the immunoreactive substances was compared to that of authentic standards, revealing a spectrum of isoflavonoid metabolites in both genera. Aglycones as well as glycosides were detected, namely daidzin, genistin, daidzein, genistein, formononetin, biochanin A, prunetin, and several incompletely characterized isoflavones. Subsequent HPLC–MS study verified the identities of the main immunoreactive isoflavones and found several others, namely glycitein, glycitin, ononin,

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sissotrin, including the malonylated and acetylated glucosides. It is concluded that the isoflavonoid metabolic pathway is present in the Myrtaceae family.

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Keywords: *Acca sellowiana*; *Psidium* species; Myrtaceae; Isoflavones; Isoflavone glycosides; Immunoassay; HPLC–MS

1. Introduction

Increased attention has been paid to isoflavones (3-phenylchromones, Fig. 1) during the last decade, due to their importance for human health (Cos et al., 2003). They are most abundant in the Fabaceae; however, they were also recorded in over 20 other families, e.g. Rosaceae, Iridaceae, Asteraceae, Poaceae, Amaranthaceae, Moraceae. Although flavones and chalcones have been described in the Myrtaceae family (Amaral et al., 2001), there are no reports on the presence of isoflavones.

The Myrtaceae is a family of at least 133 genera and more than 3800 species, including *Acca* and *Psidium* (Wilson et al., 2001). Many of them are important edible fruits, spices, ornamental or medicinal plants (Hora, 1978). *Psidium guajava* L. and *Psidium littorale* Raddi (syn. *P. cattleianum* Sabine) are shrubs or small trees grown throughout the tropics and subtropics for their edible fruits (Verheij and Coronel, 1991). The leaves of *P. guajava* are used in folk medicine as an anti-inflammatory and hemostatic agent, and for treating pulmonary diseases, coughs, vomiting and diarrhoea (Jajrj et al., 1999). Extracts from the leaves and stem bark possess antimicrobial and anti-amoebic activity (Tona et al., 1998). Some of these activities are supposed to be mediated by quercetin, a relatively common flavonoid found together with several other flavonoids in this species (Seshadri and Vashishta, 1965).

Acca sellowiana (Berg) Burret (syn. *Feijoa sellowiana* Berg) is bushy shrub native to South America, but is now grown in many subtropical areas for its edible fruits or

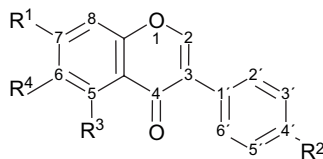


Fig. 1. Isoflavones of interest. Daidzein, $R^1 = R^2 = \text{OH}$, $R^3 = R^4 = \text{H}$; daidzin, $R^1 = \beta\text{-D-glucopyranosyl } (\beta\text{-Glu})$, $R^2 = \text{OH}$, $R^3 = R^4 = \text{H}$; genistein, $R^1 = R^2 = R^3 = \text{OH}$, $R^4 = \text{H}$; genistin, $R^1 = \beta\text{-Glu}$, $R^2 = R^3 = \text{OH}$, $R^4 = \text{H}$; formononetin, $R^1 = \text{OH}$, $R^2 = \text{OCH}_3$, $R^3 = R^4 = \text{H}$; ononin, $R^1 = \beta\text{-Glu}$, $R^2 = \text{OCH}_3$, $R^3 = R^4 = \text{H}$; isoformononetin, $R^1 = \text{OCH}_3$, $R^2 = \text{OH}$, $R^3 = R^4 = \text{H}$; biochanin A, $R^1 = R^3 = \text{OH}$, $R^2 = \text{OCH}_3$, $R^4 = \text{H}$; sissotrin, $R^1 = \beta\text{-Glu}$, $R^2 = \text{OCH}_3$, $R^3 = \text{OH}$, $R^4 = \text{H}$; prunetin, $R^1 = \text{OCH}_3$, $R^2 = R^3 = \text{OH}$, $R^4 = \text{H}$; glycitein, $R^1 = R^2 = \text{OH}$, $R^3 = \text{H}$, $R^4 = \text{OCH}_3$; glycitin, $R^1 = \beta\text{-Glu}$, $R^2 = \text{OH}$, $R^3 = \text{H}$, $R^4 = \text{OCH}_3$.

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